Space Weather Forecast

Issued on Wednesday, 28 June 2023 at 01:13 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Low to Moderate solar activity expected.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity was Moderate, with a low level Moderate-class flare peaking at 27/1514 UTC originating from a region in the northwest quadrant. There are eight sunspot regions on the visible disc, with a region in the northeastern quadrant the most significant of these. It has developed rapidly in the last 24 hours, and continues to show signs of potentially developing magnetic complexity. The remaining regions all appear relatively small and simple. A dimming from near centre disc around 27/0200UTC looked as though it may have produced a Coronal Mass Ejection (CME), but nothing has been seen in coronagraph imagery. A further eruption from near the larger region in the northeast is still being assessed.

Solar Wind / Geomagnetic Activity: The solar wind has followed a declining trend as the influence from a CME which arrived late on 24 June continues to wane. Wind speed initially varied between 500-570 km/s, and is now around 440-500 km/s. Total magnetic field strength was weak, with the north-south component also varying weakly. Geomagnetic activity was Quiet (Kp 1-2).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) has been at background levels with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to be Low to Moderate, with a slight chance of Strong flares, mainly from the rapidly developing region in the northeast.

Solar Wind / Geomagnetic Activity: A CME which was thought to potentially give Earth a glancing blow during 27 June is now considered more likely to have missed. Solar wind speeds are gradually declining following the arrival of a CME on 24 June. There is a recurrent coronal hole on the disc which appears to have had limited effects on Earth on the last rotation, and is smaller and more fragmented on this rotation with only a weak connection expected this time around. It is perhaps more likely that any coronal hole influence may simply prolong the tail of the CME effects with slightly elevated wind speeds.
Geomagnetic activity is forecast to be mainly Quiet to Unsettled, perhaps reaching Active should any CME or coronal hole influence occur.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is most likely to remain at background levels with no solar radiation storms occurring. However, there is a slight chance of count rates increasing should any larger flares occur.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	5	1	1	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	50	50	50	50
Very Active	R3 to R5 X	No	10	10	10	10

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	10	10	10
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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